



Impact of environmental changes and human-related factors on the potential malaria vector, *Anopheles labranchiae* (Diptera: Culicidae), in Maremma, Central Italy

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Abstract:

The Maremma Plain (central Italy) was hyper-endemic for malaria until the mid-20th century, when a national campaign for malaria elimination drastically reduced the presence of the main vector *Anopheles labranchiae* Falleroni. However, the introduction of rice cultivation over 30 yr ago has led to an increase in the *An. labranchiae* population and concern over possible malaria reemergence. We studied the impact of anthropogenic environmental changes on the abundance and distribution of *An. labranchiae* in Maremma, focusing on rice fields, the main breeding sites. Adults and larvae were collected in three main areas with diverse ecological characteristics. Data were collected on human activity, land use, and seasonal climatic and demographic variations. We also interviewed residents and tourists regarding their knowledge of malaria. Our findings showed that the most important environmental changes have occurred along the coast; *An. labranchiae* foci are present throughout the area, with massive reproduction strictly related to rice cultivation in coastal areas. Although the abundance of this species has drastically decreased over the past 30 yr, it remains high and, together with climatic conditions and the potential introduction of gametocyte carriers, it may represent a threat for the occurrence of autochthonous malaria cases. Our findings suggest the need for the continuous monitoring of *An. labranchiae* in the study area. In addition to entomological surveillance, more detailed knowledge of human-induced environmental changes is needed, so as to have a more complete database that can be used for vector-control plans and for properly managing emergencies related to autochthonous introduced cases.

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Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Ecosystem Changes, Extreme Weather Event, Meteorological Factors, Precipitation, Temperature

Geographic Feature:

resource focuses on specific type of geography

Ocean/Coastal, Rural

Geographic Location:

resource focuses on specific location

Non-United States

Non-United States: Europe

European Region/Country: European Country

Other European Country : Italy

Health Impact:

specification of health effect or disease related to climate change exposure

Infectious Disease

Infectious Disease: Vectorborne Disease

Vectorborne Disease: Mosquito-borne Disease

Mosquito-borne Disease: Malaria

Mitigation/Adaptation:

mitigation or adaptation strategy is a focus of resource

Adaptation

Resource Type:

format or standard characteristic of resource

Research Article

Timescale:

time period studied

Time Scale Unspecified

Vulnerability/Impact Assessment:

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content